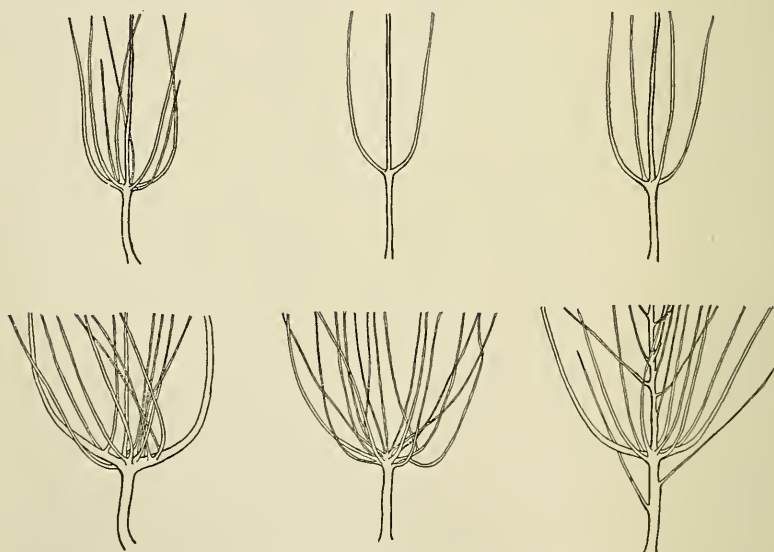


Growth form of *Linum grandiflorum* changed by X-radiation

EDNA L. JOHNSON

Plants which exhibit changed growth form in response to X-ray treatment in the seedling stage vary in the character of the type of branching which occurs. Tomatoes assume a more bushy form because of the greater development of lateral branches. This is true also for certain members of the Pink and Evening primrose families. Other species such as the castor-oil plant and sunflower are prone to show dichotomous branching. *Linum grandiflorum* and *Linaria maroccana* when treated in the seedling stage develop, as compared with the controls at maturity, a greater number of main branches from the crown; secondary branches at the bases of the main ones also occur in greater abundance.



Lower portions of plants of *Linum grandiflorum*, the scarlet flax, to show nature of branching. Above, controls; below, plants whose seedlings had been exposed to one medium dose of X-rays. Note that the main central stalk has, in two plants, been replaced by numerous branches. Greater production of branches by the central stalk of rayed plants was noticeable in two groups of *Linum* grown to maturity.

In the first group of *Linum* plants studied, the average number of main branches of the X-rayed plants was exactly twice that of the controls. Representative specimens of the group portrayed in the figure exhibit the two most outstanding features of the treated plants: a greater number of branches sent up from the crown, and increased development of secondary branches from the central stalk. It is apparent that the main central stalk, in certain plants, was replaced by numerous branches of apparently equal size.

In the second study of scarlet flax, seedlings 15 days old were irradiated for 20 minutes with the following "set-up": 91 K.V., 5 ma., distance 30 cm. A careful analysis of the measurements taken at maturity made clear the fact that the decrease in total height of the treated plants was caused by lessened growth of the central stalk up to the point where it divided to produce the terminal branches rather than to reduced

GROWTH OF *LINUM GRANDIFLORUM* (GROUP II) AFTER X-RADIATION
(15-day-old seedlings were treated with 1 dose from machine with
"set-up": 91 K.V., 5 ma., 30 cm., 20 min.)

	Control	Irradiated	Percentage difference in treated plants
No. of plants	15	15	
Average height of plants (in cm.)	39.5	33.5	-15.2*
Central stalk			
Av. length to point of division into terminal branches (in cm.)	28.5	22.7	-19.5
No. of terminal branches	43	44	+2.3
Av. length of terminals per plants (in cm.)	30.4	33.6	+10.5
Percentage of plants bearing laterals on central stalk	53.3	86.7	+62.7
Av. no of lateral branches	1.9	4.0	+110.5
Av. length of lateral branches (in cm.)	6.9	26.1	+278.2
Average number of branches other than on central stalk	14.7	14.5	-1.4
Av. no. of days before blossoming occurred	124	126	+1.6
Av. no. of fresh blossoms at close of experiment (165 days)	7.3	6.9	-5.5

* The minus sign indicates that the treated showed less growth than the controls; the plus sign that they exhibited greater growth.

growth of the terminal branches. The average length of the central stalk was decreased 19 per cent while the terminal divisions were increased 10 per cent over those present in the controls.

The growth form was greatly changed by the increase in the development of branches from the central stalk. Eighty-seven per cent of experimental plants bore laterals on the central stalk as contrasted with 53 per cent of the check plants. Not only did the number of laterals on the central stalks of the former average twice as many as on the controls but their average total length per plant was almost four times as great. The number of branches other than those from the central stalk was practically the same in the two groups.

Blossoming was slightly retarded in the treated specimens. In the first group particularly, the treated plants looked unusually handsome because the flowers on the numerous branches all blossomed at about the same time.

UNIVERSITY OF COLORADO
BOULDER, COLORADO